CLAIMS

What is claimed is:

1. A DNA construct comprising at least one therapeutic gene under transcriptional control of the WAP or MMTV regulatory sequences for the treatment of disorders or diseases of human mammary cells, including human mammary carcinoma.

2. A DNA construct according to claim 1 wherein the regulatory sequence comprises the proximal 445 bp of the WAP promoter including the transcription initiation site.

3. A DNA construct according to claims 1 wherein the regulatory sequence contains the 320 bp XhoI/XbaI fragment of the WAP promoter region.

4. A DNA construct according to claim 1 wherein the regulatory sequence is the U3 region of MMTV.

5. A DNA construct according to claim 1 wherein the regulatory sequence contain the 0.6 Kb PstI MMTV promoter fragment.

6. A DNA construct according to claim 1 which is a recombinant vector selected from viral and plasmid vectors.

7. A recombinant vector according to claim 6 wherein said viral vector is selected from RNA and DNA viral vectors and said plasmid vector is selected from eucaryotic expression vectors.

8. A recombinant vector according to claim 7 wherein said viral vector is a retroviral vector, a recombinant adenovirus vector, a recombinant adeno-associated virus vector or a recombinant herpes virus vector.

9. A recombinant vector according to claim 8 wherein the retroviral vector comprises a 5'LTR region of the structure U3-R-U5; at least one coding sequence coding for a therapeutic gene; and a 3' LTR region comprising a completely or partially deleted U3 region wherein said deleted region has been replaced by a polylinker containing the WAP or MMTV regulatory sequences followed by the R and U5 region, said therapeutic gene being under transcriptional control of the WAP or MMTV regulatory sequences.

10. A construct according to claim 1 wherein the therapeutic gene is selected from anti-tumor genes and cytokine genes for the treatment of human mammary carcinoma.

11. A construct according to claim 10, wherein said therapeutic gene is selected from the group consisting of genes which code for proteins such as Herpes Simplex Virus thymidine kinase, cytosine deaminase, guanine phosphoribosyl transferase (gpt), cytochrome P 450, cell cycle regulatory genes which code for proteins such as SDI, tumor supressor genes which code for proteins such as p53, antiproliferation genes which codes for proteins such as melittin, cecropin or cytokines such as IL-2.

12. A recombinant retroviral particle produced by culturing a packaging cell line harbouring a retroviral vector construct according to claim 8 and one or more constructs coding for the proteins required for the genome of said retroviral vector to be packaged, for the treatment of disorders or diseases of human mammary cells, including human mammary carcinoma.

13. A retroviral provirus carrying a construct comprising at least one therapeutic gene under transcriptional control of the WAP or MMTV regulatory sequences integrated in the human genome.

14. A retroviral provirus according to claim 13 comprising a 5'LTR region comprising a completely or partially deleted U3 region wherein said deleted region has been replaced by a polylinker containing the WAP or MMTV regulatory sequences followed by the R and U5 region; at least one coding sequence coding for a therapeutic gene; and a 3' LTR region comprising a completely or partially deleted U3 region wherein said deleted region has been replaced by a polylinker containing the WAP or MMTV regulatory sequences followed by the R and U5 region, said therapeutic gene being under transcriptional control of the WAP or MMTV regulatory sequences.

15. A cell line containing a construct according to claim 1 for the treatment of disorders or diseases of human mammary cells, including human mammary carcinoma.

16. A packaging cell line harbouring a retroviral vector construct according to claim 6 and one or more constructs coding for the proteins required for the genome of said retroviral vector to be packaged.

17. A human cell containing a retroviral provirus according to claim 13.

18. Encapsulated cells comprising a core containing cells according to claim 15, and a porous capsule wall surrounding said core, said porous capsule wall being permeable to the therapeutic polypeptide or the viral particles produced by said cells for the treatment of disorders or diseases of human mammary cells, including human mammary carcinoma.

19. Encapsulated cells according to claim 18 wherein said porous capsule wall consists of a polyelectrolyte complex formed from counter charged polyelectrolytes.

20. The use of a construct according to claim 1 for the preparation of a medicament for the treatment of disorders or diseases of human mammary cells, including human mammary carcinoma.

21. The use of a recombinant viral particle according to claim 12 for the manufacture of a medicament for the treatment of disorders or diseases of human mammary cells, including human mammary carcinoma.

22. The use of cells according to claim 15 for the manufacture of a medicament for the treatment of a disorder or disease of human mammary cells, including human mammary carcinoma.

23. A pharmaceutical composition for the treatment of disorders or diseases of human mammary cells, including human mammary carcinoma comprising a DNA construct according to claim 1 and a pharmaceutically acceptable carrier or diluent.

24. A pharmaceutical composition for the treatment of disorders or diseases of human mammary cells, including human mammary carcinoma comprising a recombinant retroviral particle according to claim 12 and a pharmaceutically acceptable carrier or diluent.

25. A pharmaceutical composition for the treatment of disorders or diseases of human mammary cells, including human mammary carcinoma comprising a cell line according to claim 15 and a pharmaceutically acceptable carrier or diluent.

26. The use of the WAP or MMTV regulatory sequences for the expression of linked therapeutic genes in human mammary cells, including human mammary carcinoma cells.

27. The use according to claim 26, wherein the regulatory sequence comprises the proximal 445 bp of the WAP promoter including the transcription initiation site.

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28. The use according to claim 26 wherein the regulatory sequence contains the 320 bp XhoI/XbaI fragment of the WAP promoter region.

29. The use according to claim 26, wherein the regulatory sequence is the U3 region of MMTV.

30. The use according to claim 26, wherein the regulatory sequence contain the 0.6 Kb PstI MMTV promoter fragment.

31. The use according to claim 26, wherein the therapeutic gene is selected from anti-tumor genes and cytokine genes.

32. The use according to claim 31, wherein said therapeutic gene is selected from the group consisting of genes which code for proteins such as Herpes Simplex Virus thymidine kinase, cytosine deaminase, guanine phosphoribosyl transferase (gpt), cytochrome P 450, cell cycle regulatory genes which code for proteins such as SDI, tumor supressor genes which code for proteins such as p53, antiproliferation genes

which codes for proteins such as melittin, cecropin or cytokines such as IL-2.

33. The use according to claim 26 wherein the therapeutic gene under transcriptional control of the WAP or MMTV regulatory sequences form part of a recombinant vector selected from viral and plasmid vectors.

34. The use according to claim 33 wherein said viral vector is selected from RNA and DNA viral vectors and said plasmid vector is selected from eucaryotic expression vectors.

35. The use according to claim 34 wherein said viral vector is a retroviral vector.

36. The use according to claim 35 wherein the retroviral vector comprises a 5'LTR region of the structure U3-R-U5; at least one coding sequence coding for a therapeutic gene; and a 3' LTR region comprising a completely or partially deleted U3 region wherein said deleted region has been replaced by a polylinker containing the WAP or MMTV regulatory sequences followed by the R and U5 region, said therapeutic gene being under transcriptional control of the WAP or MMTV regulatory sequences.

37. A method for the treatment of human mammary carcinoma comprising administering to a human in need thereof a construct according to claim 1.

38. A method for the treatment of human mammary carcinoma comprising administering to a human in need thereof a viral particle according to claim 12.

39. A method for the treatment of human mammary carcinoma comprising administering to a human in need thereof cells according to claim 15.

40. A method for the treatment of human mammary carcinoma comprising implanting into a human in need thereof encapsulated cells according to claim 19 either in or nearby the site of the tumor.